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ABSTRACT

This document examines the differences of cognitive styles and how they pertain to student performance and effective teaching. Persons identified as "field-dependent" people are particularly attuned and differentially attend to the social dimensions of their environment. Due to this orientation, these persons appear to be more skillful at learning socially oriented material such as social studies and humanities. Students identified as "field-independent", on the other hand, appear to behave as if governed by general, internally consistent principles that they have abstracted from their experiences. Such students experience greater success at subjects less social, such as math and science. Teachers also give evidence of similar cognitive styles, and these ways of thinking influence their teaching methods. Effective reinforcement methods, modes of criticism, and teaching techniques based upon understanding these differences in cognitive style are examined. The implications for preservice teacher education programs are identified, and a strategy for teacher inservice treatment techniques is proposed. It is also suggested that further applications of the cognitive-style construct to the placement of students and teachers with similar cognitive styles could enhance the learning experience. (JD)

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IMPLICATIONS OF COGNITIVE STYLE FOR TEACHERS AND LEARNERS

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IMPLICATIONS OF COGNITIVE STYLE FOR TEACHERS AND LEARNERS

Research about cognitive styles over the past twenty-five years has resulted in increasingly sensitive and useful methods and concepts about an individual's preferred cognitive style, and the relationship of those styles to various educational problems. Among the most promising conceptualizations of cognitive style is the field-dependence-independence dimension studied extensively by Witkin, et al., (1974/1977). Although the research on the educational applications of cognitive style is still in formative stages, the available evidence does suggest that a cognitive-style approach may be applied to a wealth of educational issues.

The purpose of this paper is: 1.) to identify from the literature the salient psychological factors which comprise the dimension known as cognitive style that affect student learning and teacher instruction, 2.) to identify implications for pre-service teacher education programs, 3.) to propose a strategy for teacher inservice treatment techniques concerning the identification of instructional strengths that issue from the application of context - appropriate cognitive styles and their transfer to target areas, and 4.) to propose further applications of the cognitive-style construct to the placement of students and teachers in carefully designed educational settings.

Student Learning - Teacher Instruction

Witkin's (1977) review of the literature indicated two principle connecting links between learning behavior and cognitive style. The first utilizes social characteristics as a connecting link between the two domains, whereas the second focuses primarily on cognitive characteristics.

Student Learning

The literature reflects four principle areas of research concerning learning in which the individual's preferred cognitive style has been found to play a key role in the progress and outcomes of the process. These areas have been identified by Witkin (1977) as; 1.) learning of social material, 2.) effects of reinforcements, 3.) use of mediators, and 4.) cue salience.

Crutchfield, et al., (1958) indicates that field-dependent people are particularly attuned and differentially attend to the social dimensions of their environment. Due to this orientation, field-dependent persons appear to be more skillful at learning socially oriented material, than are field-independent persons. In 1972, Ruble and Nakamura arrived at essentially the same findings.

Examples of field-dependent persons superior performance on tasks requiring the memorization of social information comes from studies by Adcock and Webberley (1971) and Baker (1967). Both studies indicate that field-dependent persons are not only superior at memorizing social material, but are also selectively attentive to the faces of their peers which apparently serve as cues to understanding the task at hand. A related study by Fitzgibbons et al., (1965), found that a social intermediator (e.g., a peer) could effect the social connotations of words in an incidental-learning paradigm. His findings suggest that field-dependent subjects recalled more "social words" than their field-independent counterparts.

Collectively, these findings suggest that field-dependent persons are superior at remembering social material and that this superiority is based on their selective attention to social material. Thus, students who are field-dependent are particularly skilled at learning and remembering subjects with

a social content e.g., social studies and humanities, oriented material whereas field-independent children are less accomplished in this area and experience greater success at subjects less social, such as math and science. Since one's cognitive style is not a consistent predictor of sheer learning or memory ability, the role of the teacher in emphasizing content material with a social orientation to field-independent students becomes apparent, and similarly field-dependent students need additional assistance in learning more analytic tasks.

Research examining the effects of differential reinforcements on student learning have generally focused on the relationship between differences in the sense of separate identity between relatively field-dependent and field-independent students. People who are relatively field-independent tend to have an internalized frame of reference, similar to the concept of internal locus of control. Conversely, field-dependent people manifest their external frame of reference in learning, similar to those characterized by an external locus of control. The evidence from studies by Fitz (1971), Paclisanu (1970), and Steinfeld (1973), indicate that field-independent persons learn more under conditions of intrinsic motivation whereas field-dependent people learn more when reinforced externally.

Punishment, in the form of verbal criticism, provides additional evidence of this principle. Duvall (1970), Terrell (1971), Fitz (1971), Konstadt and Forman (1965), and Randolph (1971) arrived at similar findings suggesting that field-dependent persons are more affected by criticism than field-independent people; however, the manner in which the criticism is administered affects the specific outcomes (Gagne, et al., 1965). Although work in the area of reinforcement and learning on the basis of cognitive style has just begun (Raab, 1974) the evidence, collectively, suggests that field-dependence-independence may provide an important basis for designing learning sequences.

Further examples of the role of cognitive style preferences in learning are found in the area of informational mediators. Field-dependent persons, because they are less likely to restructure an ambiguous event, and therefore, less likely to utilize mediators in learning, tend to accept the material as presented. Field-independent people, on the other hand, appear to behave as if governed by general, internally consistent, principles which they have abstracted from their experiences (Witkin, et al., 1977). Studies examining the use of mediators (for example, Fleming, 1968), have generally investigated situations in which the material to be learned lacks any clear inherent structure, thus requiring that the subject provide organization as an aid to learning. Results of these studies (for example, Koran, Snow and McDonald, 1971; Schwen, 1970; Renzi, 1974; Greene, 1972), suggest that field-dependent persons are more likely to experience difficulty learning ambiguous material than are field-independent people. Emmerich (1977) noted that teachers also perceive the need for greater external structure by field-dependent students. One implication of the findings of these studies is that field-dependent students, due to their lesser use of mediators, may experience interference with their learning in less structured curriculum areas (e.g., the humanities). Clearly, discovery, expository and other instructional techniques will have to be carefully evaluated, on a per pupil basis in order to maximize teaching/learning efforts and results.

A final area which has received considerable attention in the literature relative to cognitive style and learning is that of cue salience. Bruner et al., (1956), has suggested that "noticeable cues" are more likely to be used in the learning of a concept than less salient ones. Given the relationships identified by Witkin and his colleagues (1954, 1962, 1974) relative to field-dependence-independence and an individual's responsiveness to the arrangement of the field it was found that field-dependent people are much more likely to respond to the effect of cue salience then field-independent persons.

Dickstein (1968) found that in typical studies of concept attainment field-dependent learners (in formulating responses to questions) tended more often to ignore some attributes. Conversely, field-independent subjects tend to sample more fully and more objectively from the available cues for concept definition. Consistent with these findings are those obtained in a study by Goodenough (1976). Apparently field-dependent people learn more rapidly than field-independent people when the cues presented are relevant to the attainment of the concept. One concern educators express is how to help field-dependent persons from experiencing dysfunctional learning sets which interfere with the attainment of further concept development. Suggestions for classroom aids to cue useability are reported by Shapson (1973). Techniques for teaching concept to field-dependent learners is therefore an important task, and calls for further experimental research.

Collectively, these studies represent a sampling from current research on the role of cognitive style in student learning preferences. They suggest that students tend to prefer distinctive learning styles and behaviors related to their own dominent cognitive style. There is no suggestion made that one "style" may result in consistently superior learning, but rather that certain approaches may be better suited to certain tasks and situational factors. Later a treatment model will be presented which will suggest techniques for prescriptive adaptation and intervention techniques teachers can use in aiding students in diversifying learning approaches.

Instructional Preferences

Research on the role of teachers' cognitive style in their approaches to instruction suggests that field-dependent-independent individuals may approach the pedegogical task in very different ways. Very little research has been conducted in this area. From the lengthy bibliographies prepared by Witkin and his associates at Educational Testing Service, little is apparently known about the preferences teachers exhibit in their teaching

approach. It is known that field-dependent teachers prefer greater interaction with their students whereas field-independent teachers prefer teaching situations that are impersonal in nature, and oriented toward more abstract, cognitive aspects of instruction.

Moore (1973) found that field-independent teachers prefer to use questions as instructional tools more frequently than field-dependent teachers; in areas such as introducing new units and following student answers. Field-dependent teachers however, prefer to use questions primarily as a means to assess student learning after the instructional phase has been completed.

Emmerich reports that field-dependent teachers indicated after a social studies minicourse lesson that they felt class discussion and not teacher-lectures were effective in promoting student learning. Additionally, it was found that high student involvement in structuring the learning activity was seen by field-dependent teachers (and not field-independent ones) as a useful teaching technique. Emmerich also found that teachers vary on preferences for kinds of reinforcement. Field-independent teachers appear to prefer feedback indicating errors (negative evaluation) and explanations underlying the error. It was felt by these field-independent teachers that cognitive feedback enhances learning. These findings are consistent with related studies by Bogo, et al., (1970), and Greenfield (1969) found that field-independent persons use critical comments toward others more often than field-dependent persons.

Engelhardt (1973), examined the teaching behaviors of field-dependent and field-independent teachers, using Hall's observation schedule and found no significant relationship between cognitive style and intensity of teaching style, or consistency of teaching. Ohnmacht (1967), also found no relation between field-dependence-independence and the summary categories of Flanders interaction analysis. At this point, conclusions about the teaching differences of field-dependent-independent teachers is limited due to the lack of

actual classroom research. The research to date has been primarily simulated. These simulated conditions have found some differences but still much investigation to be done. Just as cognitive style differences do not result in distinctly superior learning results, teaching preferences do not indicate significant differences in teaching competency. As Witkins (1977), states: "The difference between field-dependent and field-independent teachers seems to be rather in approach to the teaching situation, the consequences of which are not likely to be detected in gross student achievement indices." The central questions raised by our awareness of these differences are 1.) what can preservice teacher education do to prepare prospective teachers of varying styles to adopt teaching approaches that arise within the context of the heterogenous classroom, and 2.) can they alternate skills related to their preferred and less preferred style to more effectively accommodate the unique qualities of varied content material.

The literature shows that relatively field-dependent persons and relatively field-independent persons tend to favor different learning approaches. As Kagan (1965), has discovered in his research on cognitive style the approaches favored by either conceptual type does not necessarily [illegible] for better achievement than the approaches favored by the other kind. Learning outcomes seem to be highly context dependent and specific to characteristics of the learning task.

Teachers can become more effective in adapting instructional procedures to the needs of these different kinds of students. Similarly students can be made aware of and supported in adapting their learning styles to different instructional procedures. As Witkin (1977) et al., suggests: "The apparent malleability of learning strategies flowing from cognitive styles provides encouragement to the hypothesis that students can be helped to diversify their learning strategies."

Teacher-Preparation

If further research indicates value in this approach to the teaching-learning process, it is then implicit to the design of an effective teacher-preparation program, 1.) to develop an awareness of the role of cognitive style in teaching behavior, and 2.) the development of the knowledge and skills needed to enable prospective teachers to adjust their instructional style to the varied learning modes of students. What is urgently needed is not only basic instruction on how children learn, but also knowledge of how to rapidly adapt one's instructional style to fit the nature of given content matter. No doubt there will be a certain amount of energy inefficiently expended in such a dynamic process, but clearly the need exists. Therefore, to the extent that teachers recognize the varied learning modes students present to them the more effective they may become if they can present a diversity of instructional skills to accommodate individual student differences.

Inservice Treatment Techniques

It can be argued that to be an effective teacher it is both necessary and highly desirable to carefully analyze one's actual teaching behavior. Research by Flanders, Medley, Withal, Jackson, and many others has clearly shown that teachers do not initiate or respond to students uniformly. The characteristics relevant to these differential interactions have been widely studied, yet little assistance has been provided to the classroom teacher in coping and adapting to individual student differences that arise from varied cognitive styles - of both student and teacher.

A five point intervention strategy is proposed to help classroom teachers better accommodate individual differences and enhance the quality of their instruction.

1.) Through observation, identify the teacher's dominant instructional characteristics and preferred conceptual style.

2.) Through observation of classes identify a few target students to include in the treatment plan. These would include children whose educational needs were not being sufficiently met within the existing context.

3.) Devise, with the teacher, a treatment plan designed to identify existing instructional strengths; strategies of the treatment should start with a limited number of students, utilizing pre-existing strengths of the teacher.

4.) To implement the plan, a treatment agent (colleague, assistant principal, supervisor, etc.) should be available for classroom observation and assistance when required. Data would be recorded that will directly answer the questions posed in step 2 regarding the designated target children.

5.) The data would then be evaluated to determine if appropriate changes have occurred for both teachers and students. Then determine if the teacher has been successful in transferring appropriate instructional behaviors to target areas and if target students have responded in the desired direction.

Teacher-Student Placements

The concept of student-teacher matching on the basis of cognitive style has attracted relatively little attention in educational settings. In patient-therapist contexts however, some research has been conducted

which suggests that matching on this variable does result in more effective treatment as measured by drop-out rate of clients. In addition to advantages gained through positive attraction between teachers and students which intuitively should enhance classroom climate, the knowledge provided to teachers about the effects of cognitive style on classroom interaction will allow them to adapt their teaching strategies to the needs of dissimilar learners.

The implication of the effectiveness of matching is that for teachers who experience difficulty in adapting or who prefer not to adapt have an alternative available. To match teachers and students in either category may result in equally satisfactory results.

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